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# Is Wi-Fi Safe for Children?

We fully support the use of computers and the promotion of technology in education, but we believe that it must be implemented in a SAFE manner. We should not expose our children to unnecessary health risks by Wi-Fi, while there are hardwired options available.

## Scientific Studies 科研报告

### Some Peer-reviewed Studies on the Biological Effects from 2.45Ghz (Wi-Fi range) Radiofrequency

#### Use Of Laptop Computers Connected To Internet Through Wi-Fi Decreases Human Sperm Motility And Increases Sperm DNA Fragmentation

"Ex vivo exposure of human spermatozoa to a wireless internet-connected laptop decreased motility and induced DNA fragmentation by a nonthermal effect."

<http://tinyurl.com/bwt6ten>

#### Effects Of Wi-Fi Signals On The P300 Component Of Event-Related Potentials During An Auditory Hayling Task

"To the best of our knowledge, this is the first attempt to investigate the immediate effects of Wi-Fi signals upon brain operation, specifically on the P300 ERP component... As far as the different Hayling tasks are concerned, results show significantly decreased amplitude values for the response inhibition condition in a large area of the brain."

<http://tinyurl.com/3ntyj73>

#### Wi-Fi Electromagnetic Fields Exert Gender Related Alterations On EEG

"It is concluded that Wi-Fi may influence normal physiology through changes in gender related cortical excitability as it is reflected by the alpha and beta EEG frequencies."

<http://tinyurl.com/3jpzxtn>

#### Mutagenic response of 2.45 GHz radiation exposure on rat brain.

"The authors conclude that the chronic exposure to 2.45 GHz microwaves may cause a significant damage to the brain, which may be an indication of possible tumour

## PAGES

- Home
- 中文网页: 电磁微波辐射与孩子健康
- Reference for SD Trustees
- Scientific Studies 科研报告
- Practical Ways to Reduce EMF Radiation 下载传单 Flyers...
- Frequently Asked Questions
- The Precautionary Principle 预防原则

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promotion."

<http://www.ncbi.nlm.nih.gov/pubmed/20353343>

#### Single strand DNA breaks in rat brain cells exposed to microwave radiation.

"The data showed that the chronic exposure to 2.45 and 16.5 GHz under these experimental conditions caused a statistically significant increase in DNA single-strand breaks (increase in the length of DNA migration) in brain cells of rats."

<http://www.ncbi.nlm.nih.gov/pubmed/16458332>

#### Some behavioral effects of short-term exposure of rats to 2.45 GHz microwave radiation.

"Microwave-exposed animals exhibited less activity than sham-exposed animals...

Both the locomotor activity and acoustic startle data demonstrate that, under the conditions of this experiment, microwave exposure may alter responsiveness of rats to novel environmental conditions or stimuli."

<http://www.ncbi.nlm.nih.gov/pubmed/3178900>

#### Erythropoietic changes in rats after 2.45 GHz nonthermal irradiation.

"In the applied experimental condition, RF/MW radiation might cause disturbance in red cell maturation and proliferation, and induce micronucleus formation in erythropoietic cells."

<http://www.ncbi.nlm.nih.gov/pubmed/15729835>

#### Genotoxic effects of low 2.45 GHz microwave radiation exposures on Sprague Dawley rats.

"We conclude that low SAR 2.45 GHz MW radiation exposures can induce DNA single strand breaks and the direct genome analysis of DNA of various tissues demonstrated potential for genotoxicity."

<http://www.academicjournals.org/ijgmb/PDF/pdf2010/Nov/Aweda%20et%20al.pdf>

#### Effects of exposure to 2.45 GHz microwave radiation on male rat reproductive system.

"Conclusion: MW radiation exposures caused reduction in sperm counts and motility and increased the proportion of abnormal sperm cells and induced reduction in sperm count and motility while increasing the proportion of abnormal sperm cells."

<http://www.journalcra.com/?q=node/380>

#### Testicular apoptosis and histopathological changes induced by a 2.45 GHz electromagnetic field.

"Electromagnetic field affects spermatogenesis and causes to apoptosis due to the heat and other stress-related events in testis tissue."

<http://tjh.sagepub.com/content/early/2011/01/27/0748233710389851.abstract>

#### Effects of 2.45 GHz microwaves on meiotic chromosomes of male CBA/CAY mice.

"The findings are interpreted to indicate interference with normal spermatogenesis during the exposure period."

<http://jhered.oxfordjournals.org/content/76/1/71.short>

#### Effects of microwave at 2.45 GHz radiations on reproductive system of male rats.

"Chronic exposure to these radiations produced formation of apoptotic cells in testis. In addition, a significant decrease in the levels of GPx, and SOD activities as well as an increase in CAT activity was observed in the exposed group. These results indicate that a low level exposure of microwave radiations exerts a negative impact on male reproductive system function."

<http://www.informaworld.com/smpp/content~content=a922592632~db=ali~jumtype=rss>

#### Laptop expositions affect motility and induce DNA fragmentation in human spermatozoa in vitro by a nonthermal effect: a preliminary report.

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- Studies on Biological and Cellular Damage by Microwave & Radiofrequency Radiation
- Israel's Position Paper on Electromagnetic Radiation in a School Environment
- Dr. George Carlo speaks on Wi-Fi Radiation in Schools
- LATEST WARNING: Wi-Fi Dangerous to Children and Pregnant Women
- The Essential Message
- Surprise! China's Safety Standard >100 times stricter than Canada's
- International Warnings on Wi-Fi and Microwave Radiation
- Removal of Wi-Fi from Schools and Libraries in Canada and Other Countries
- Wi-Fi in the Education Environment
- Protect your children from cell phone and WiFi radiation before it's too late
- A letter to "Concerned Parent" on WLAN (Wi-Fi)
- Children's Exposure to Microwave Radiation - A letter to the Sooke School Board
- Children are Particularly Susceptible to the Harm of Wi-Fi
- Wi-Fi Concerns Should Lead to Updated Regulations - A Letter by Carol Hughes, MP
- How to reduce Wi-Fi (Microwave) Radiation on our Children
- Mobile Learning and Health Risks Slideshow by University of Tampere, Finland
- The World Health Organization
- We are not alone! Victoria School District is re-evaluating the safety of Wi-Fi
- The current debate on Wi-Fi being installed in schools without Parents' consent
- Electromagnetic Induction by Wi-Fi causes Human Tissue to Polarize at Twice the Frequency
- At a Glance - The issue of Wi-Fi in School

#### BLOG ARCHIVE

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► 2012 (9)

▼ 2011 (29)

► November (2)

"We have demonstrated that exposure to laptops decrease progressive motility and induce DNA fragmentation in human spermatozoa in vitro by a non-thermal effect. We speculate that keeping the laptops (WiFi mode) on the lap near the testes may result in decreased male fertility."

[http://www.safeschool.ca/uploads/Laptop\\_Expositions.pdf](http://www.safeschool.ca/uploads/Laptop_Expositions.pdf)

**Provocation study using heart rate variability shows microwave radiation from DECT phone (2.45 Ghz) affects autonomic nervous system.**

M. Havas, J. Marrongelle, B. Pollner, E. Kelley, C.R.G. Rees, L. Tully

European Journal of Oncology Library Vol. 5, 273-300

"This is the first study that documents immediate and dramatic changes in both Heart Rate (HR) and HR variability (HRV) associated with MW exposure at levels well below (0.5%) federal guidelines in Canada and the United States (1000 microW/cm2)."

[http://www.avaate.org/article.php3?id\\_article=2043](http://www.avaate.org/article.php3?id_article=2043)

[http://www.avaate.org/IMG/pdf/Dect\\_and\\_WifiHavas-HRV-Ramazzini1.pdf](http://www.avaate.org/IMG/pdf/Dect_and_WifiHavas-HRV-Ramazzini1.pdf)

**DNA Strand Breaks in Rat Brain Cells Exposed to Low level Microwave Radiation (2.4 GHz)- Environmental Sciences**

<http://www.ursi.org/proceedings/procGA08/papers/K02bp2.pdf>

**Some Studies on Biological Effects from Cell Phone Towers (pulsed Microwave Radiation similar to Wi-Fi)**

**Mobile Phone Mast Effects on Common Frog (Rana temporaria) Tadpoles: The City Turned into a Laboratory**

"In the exposed group, low coordination of movements, an asynchronous growth, resulting in both big and small tadpoles, and a high mortality (90%) was observed. Regarding the control group (n ¼ 70) under the same conditions but inside a Faraday cage, the coordination of movements was normal, the development was synchronous, and a mortality of 4.2% was obtained."

[http://citizensforsafetechnology.org/uploads/balmori\\_city\\_as\\_lab1.pdf](http://citizensforsafetechnology.org/uploads/balmori_city_as_lab1.pdf)

**Analyzing The Health Impacts Of Modern Telecommunications Microwaves**

"The present set of experiments (a more detailed description can be found in Panagopoulos et al. 2010) showed that, the bioactivity of GSM radiation in regards to short-term exposures is evident for radiation intensities down to 1 µW/cm2. This value of radiation intensity is encountered at about 1 m distance from a cell-phone or about 100 m distance from a corresponding base station antenna... It is possible for long-term exposure durations (weeks-months-years) that the effect would be evident at even longer distances/smaller intensities."

"The bioactivity "windows" found in our experiments, could possibly correlate with recent results of another experimental group reporting that GSM radiation caused increased permeability of the blood-brain barrier in rat nerve cells and the strongest effect was produced by the lowest SAR values which correspond to the weakest radiation intensity, (Eberhardt et al 2008)."

"The effect of cell death induction in the developing eggs of the exposed female insects, just like the corresponding effect on the reproductive capacity... evident for distances up to 100 cm (radiation intensities down to 1 µW/cm2)."

<http://www.citizensforsafetechnology.org/uploads/scrbd/Panagopoulos-Nova-2011-Adv%20Med%20Biol-review-chapter.pdf>

**Neurobehavioral effects among inhabitants around mobile phone base**

**stations.** Neurotoxicology. 28(2):434-40 Abdel-Rassoul G, El-Fateh OA, Salem MA, Michael A, Farahat F, El-Batanouny M, Salem E (March 2007).

"Inhabitants living nearby mobile phone base stations are at risk for developing neuropsychiatric problems and some changes in the performance of neurobehavioral functions either by facilitation or inhibition. So, revision of standard guidelines for

► August (2)

▼ June (1)

World Health Organization labels wireless: "Possib..."

► May (1)

► April (3)

► March (5)

► February (15)

public exposure to RER from mobile phone base station antennas and using of NBTB (neurobehavioral test battery) for regular assessment and early detection of biological effects among inhabitants around the stations are recommended."

<http://www.ncbi.nlm.nih.gov/pubmed/16962663>

#### **GSM base station electromagnetic radiation and oxidative stress in rats.**

Electromagn Biol Med. ;25(3):177-88 Yurekli AI, Ozkan M, Kalkan T, Saybasili H, Tuncel H, Atukeren P, Gumustas K, Seker S (2006).

"When EM fields at a power density of 3.67 W/m<sup>2</sup> (specific absorption rate = 11.3 mW/kg), which is well below current exposure limits, were applied, MDA (malondialdehyde - a marker for oxidative stress) level was found to increase and GSH (reduced glutathione, a major antioxidant) concentration was found to decrease significantly ( $p < 0.0001$ ). Additionally, there was a less significant ( $p = 0.0190$ ) increase in SOD (superoxide dismutase) activity (cell-repair) under EM exposure."

<http://www.ncbi.nlm.nih.gov/pubmed/16954120>

#### **Risk Evaluation of Potential Environmental Hazards From Low Frequency Electromagnetic Field Exposure Using Sensitive in vitro Methods. EU Programme.**

"Quality of Life and Management of Living Resources" - [View Foreword and Download Report]

"Genotoxic effects and a modified expression of numerous genes and proteins after EMF exposure could be demonstrated with great certainty... Since all these observations were made in in vitro studies, the results obtained neither preclude nor confirm a health risk due to EMF exposure, but they speak in favour of such a possibility."

[http://www.powerwatch.org.uk/news/20041222\\_reflex.asp](http://www.powerwatch.org.uk/news/20041222_reflex.asp)

#### **Investigation on the health of people living near mobile telephone relay stations: //Incidence according to distance and sex.**

Pathol Biol (Paris). 50(6):369-73 Santini R, Santini P, Danze JM, Le Ruz P, Seigne M (July 2002).

"Women significantly more often than men ( $p < 0.05$ ) complained of headache, nausea, loss of appetite, sleep disturbance, depression, discomfort and visual perturbations. This first study on symptoms experienced by people living in vicinity of base stations shows that, in view of radio protection, minimal distance of people from cellular phone base stations should not be  $< 300$  m."

<http://www.ncbi.nlm.nih.gov/pubmed/12168254>

#### **Possible Effects of Electromagnetic Fields from Phone Masts on a Population of White Stork (Ciconia ciconia).**

Balmori Alfonso (2005). Electromagnetic Biology and Medicine, 24: 109-119

"Total productivity (number of young per couple, including nests with 0 chicks) for nests within 200m of the antenna was 0.86 (0.7 - 1.02), whereas productivity for nests further than 300m away was 1.6 (1.46- 1.74). Both were statistically significant, with a  $p$  value of 0.001. A large part of the difference here appears to be due to the likelihood of the couples in the nests near the mast (cell tower) not having any chicks: 40% of those within 200m had no chicks, whereas in the nests greater than 300m away only 3.3% did not have chicks! Odd behaviour was also noted in the storks, happening much more frequently the closer the nests were to the masts."

[http://www.powerwatch.org.uk/news/20051006\\_storks.asp](http://www.powerwatch.org.uk/news/20051006_storks.asp)

#### **Increased incidence of cancer near a cell-phone transmitter station. Wolf R, Wolf D (April 2004). International Journal of Cancer Prevention Vol1, No2 - [Download Report]**

"The measured level of RF radiation (power density) in the area was low; far below the current guidelines based on the thermal effects of RF exposure. We suggest, therefore, that the current guidelines be re-evaluated. The enormous short latency period; less than 2 years, indicates that if there is a real causal association between RF radiation emitted from the cell-phone base station and the cancer cases (which we strongly believe there is), then the RF radiation should have a very strong

promoting effect on cancer at very low radiation!... Such unusual appearances of cancer cases due to one accused factor on two completely different occasions is alarming."

[http://www.powerwatch.org.uk/news/20050207\\_israel.pdf](http://www.powerwatch.org.uk/news/20050207_israel.pdf)

#### **The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer.**

Horst Eger, Klaus Uwe Hagen, Birgitt Lucas, Peter Vogel, Helmut Voit (April 2004). Umwelt Medizin Gesellschaft 17

"... the risk of developing cancer for those living within 400 metres of the mast (cell phone tower) in comparison to those living outside this area, was three times as high" and "the patients fell ill at least 8 years earlier."

<http://www.scribd.com/doc/46020865/The-Influence-of-Being-Physically-Near-to-a-Cell-Phone-Transmission-Mast-on-the-Incidence-of-Cancer>

[http://www.powerwatch.org.uk/news/20041118\\_naila.asp](http://www.powerwatch.org.uk/news/20041118_naila.asp)

#### **The Microwave Syndrome - Further aspects of a Spanish Study.**

Oberfeld Gerd, Navarro A. Enrique, Portoles Manuel, Maestu Ceferino, Gomez-Perretta Claudio (August 2004). Conference Proceedings.

"All models showed statistical significant associations between the measured electric field (~ 400 MHz – 3 GHz) and 13 out of 16 health related symptoms. The strongest five associations found are depressive tendency, fatigue, sleeping disorder, difficulty in concentration and cardiovascular problems. The symptoms associated are in line with the symptoms reported in the literature as "Microwave Syndrom... Based on the data of this study the advice would be to strive for levels not higher than 0.02 V/m for the sum total, which is equal to a power density of 0.0001  $\mu\text{W}/\text{cm}^2$ ..."

[http://www.powerwatch.org.uk/news/20040809\\_spain.asp](http://www.powerwatch.org.uk/news/20040809_spain.asp)

#### **Mobile Telecommunications and Health**

##### **Review of the Current Scientific Research in view of Precautionary Health Protection (2000)**

by ECOLOG-Institut and Commissioned by T-Mobil Germany (DeTeMobil Deutsche Telekom MobilNet GmbH)

"This review of over 220 peer-reviewed and published papers found strong indications for the cancer-initiating and cancer-promoting ... genotoxic effects of these fields, like single and double stranded DNA breaks and damage to chromosomes. The findings that high frequency electromagnetic fields influence cell transformation, cell growth promotion and cell communication also point on a carcinogenic potential of the fields used for mobile telephony. The study also found teratogenic effects (birth deformities) and loss of fertility... Moreover, disruptions of other cellular processes, like the synthesis of proteins and the control of cell functions by enzymes, have been demonstrated... effects on the central nervous system, which reach from neuro-chemical effects to modifications of the brain potentials and impairments of certain brain functions. Loss of memory and cognitive function...Possible risks for the brain also arise from an increased permeability of the blood-brain barrier to potentially harmful substances, observed in several experiments on animals exposed to mobile telephone fields.

The ECOLOG report also found indications for disruptions of the endocrine and the immune system... stress reactions... increased production of stress hormones... reduction of the concentration of the hormone melatonin.... Melatonin has a central control function for the hormone system and the diurnal biological rhythms and it is able to retard the development of certain tumours. A common observation in many of the studies was the importance of pulse modulation. **Pulse modulated fields seemed to have a stronger effect than continuous fields** and that in some cases, it was the **pulse of a certain frequency which triggered the reaction...**"

<http://www.hese-project.org/hese-uk/en/niemr/ecologsum.php>

<http://www.hese-project.org/hese-uk/en/papers/ecolog2000.pdf>

#### **Health Effects in the vicinity of Radio/TV towers and mobile phone base stations**

"EMR exposes everyone and causes significant elevation of cancer rates across

many body organs, with no safe threshold. This is because of the combination of the DNA damaging biological mechanism of individual cells and the reduction of melatonin through a very sensitive brain interaction resonant process, reducing the cell damage repair rate and increasing the free radical damage rate."  
[http://www.neilcherry.com/documents/90\\_r2\\_EMR\\_Living\\_Near\\_Broadcast\\_Towers\\_Health.pdf](http://www.neilcherry.com/documents/90_r2_EMR_Living_Near_Broadcast_Towers_Health.pdf)

**Symptoms experienced by people in vicinity of base stations: III/ Incidences of age, duration of exposure, location of subjects in relation to the antennas and other electromagnetic factors.**

Santini R, Santini P, Danze JM, Le Ruz P, Seigne M (September 2003). . Pathol Biol (Paris). 51(7):412-5

"Our results show significant increase ( $p < 0.05$ ) in relation with age of subjects (elder subjects are more sensitive) and also, that the facing location is the worst position for some symptoms studied, especially for distances till 100 m from base stations."  
<http://www.ncbi.nlm.nih.gov/pubmed/12948762>

#### **Psychophysiological Indicators for Child Users of Mobile Communication.**

##### **Message 1: Present State of the Problem**

##### **Message 2: Results of Four-year Monitoring**

**N. I. Khorseva, Yu. G. Grigoriev, N. V. Gorbunova**

"It has been shown that the children's organism is more sensitive to this kind of exposure than the adult one. We have identified the following major trends of the psychophysiological indicators for child users of mobile communication: an increased number of phonemic perception disorders, abatement of efficiency, reduced indicators for the arbitrary and semantic memory, an increased fatigue. A steady decline of the parameters from high values to bottom standards has been found."  
<http://electromagnetichealth.org/electromagnetic-health-blog/russian-res-children-emf/>

#### **AUVA REPORT: Nonthermal Effects Confirmed; Exposure Limits Challenged; Precaution Demanded.**

The **Austrian Social Insurance for Occupational Risk** (Allgemeine Unfallversicherungsanstalt) commissioned the Vienna Medical University to carry out its own research project in 2009

"All across Europe the debate on exposure limits has flared up; insurance companies do not insure cell phone providers because of the incalculable health risks...the results of the report confirm long-known health risks associated with cell phone technologies... These recommendations are especially important for children. Dear parents, talk with your children about them!" This is now about the conflict between commercial interests of an industry supported by the government and the protection of public health. The BUND warns: "The ubiquitous exposure to this unnatural type of radiation at unprecedented levels of power density harms human health. Short-term and long-term health impairments are preprogrammed and will especially manifest in the next generation if politically responsible actions are not taken immediately... Impacts on the Brain...EEG changes...already set in during the first five minutes of exposure and remained unchanged for over 50 minutes thereafter... exposure causes a notable change in protein synthesis profiles... At a SAR of 2 W/kg, the demonstrated effects are reproducible and statistically highly significant, but they start to show at SAR levels as low as 0.1 W/kg ...the protein synthesis is measurable 4 hours after the exposure starts... The increased rate of synthesis returns to normal levels within 2 hours of when exposure stops... It appears that cells do notice that some proteins lose their function and that this loss of function, therefore, must be compensated for by the synthesis of new proteins... In addition, electromagnetic exposures provoke the formation of the free radical nitric oxide, resulting in an increased rate of DNA damage... such a break is a genetic disaster for the cell because it can hardly be reconciled with the survival of the cell. The cell therefore, tries to make repairs. When doing repairs, the cell indeed survives, but at the price of errors, so-called mutations, creeping in. And these mutations are lasting changes, which, in turn, also bear the risk of cancer... One of the observations showed that, among the different cells, those respond particularly strongly, which are metabolically

active. This cell property is especially pronounced in growing tissues that is, in children and youth. Consequently, these population groups would be more susceptible than average to the described effects."

"The ICNIRP (*standard which Health Canada follows*) concedes that exposure limits only protect from "short-term, acute health impacts caused by increased temperatures in tissue and that nonthermal biological effects are not taken into account."

[http://www.buildingbiology.ca/pdf/Aurva\\_Report.pdf](http://www.buildingbiology.ca/pdf/Aurva_Report.pdf)

#### **Electromagnetic Hypersensitivity: Evidence For A Novel Neurological Syndrome**

"The subject demonstrated statistically reliable somatic reactions in response to exposure to subliminal EMFs under conditions that reasonably excluded a causative role for psychological processes. Conclusion: EMF hypersensitivity can occur as a *bona fide* environmentally-inducible neurological syndrome."

#### **Dr. David McKeown Medical Officer of Health to Toronto Board of Health (2007)**

Subject: Prudent Avoidance Policy on Siting Telecommunication Towers and Antennas

"The Board of Health should encourage Health Canada to review current standards and set public exposure limits for RFs under Safety Code 6 so as to be 100 times more protective."

[http://www.toronto.ca/health/hphe/pdf/boh\\_report.pdf](http://www.toronto.ca/health/hphe/pdf/boh_report.pdf)

#### **Environmental Pollution on Microwave Radiation - A Potential Threat to Human Health**

A 1973 Canadian Research Report

"In view of the expected proliferation of MW devices in many different applications, a substantial increase in MW background activity is feared that may endanger human health. On this basis strict control of the use of these devices must be introduced while present safety standards are revised and extensive research is conducted into long term effects of exposure to low intensity MW radiation. In particular, a study of possible accumulative effects of MW radiation (directly or indirectly) through sensitization must be conducted . "

[http://www.next-up.org/pdf/EMF\\_NRC\\_Canada\\_1973\\_microwave\\_threat.pdf](http://www.next-up.org/pdf/EMF_NRC_Canada_1973_microwave_threat.pdf)

#### **Declassified U.S. Navy Report on the Biological Effects of Microwave Radiation**

This 1971 report referenced more than 2300 research articles listing more than 120 illnesses caused by radio frequency and microwave radiation including damage to the thyroid, blood, reproductive organs, heart and brain in addition to cell mutations.

[http://safeschool.ca/uploads/Navy\\_Radiowave\\_Brief\\_1\\_.pdf](http://safeschool.ca/uploads/Navy_Radiowave_Brief_1_.pdf)

#### **Most cancer in firefighters is due to radio-frequency radiation exposure not inhaled carcinogens**

<http://www.sammlham.com/Cancer%20in%20firefighters%20due%20to%20radio-frequency%20exposure.pdf>

#### **Biological effects from electromagnetic field exposure and public exposure standards.**

"Health endpoints reported to be associated with ELF and/or RF include childhood leukaemia, brain tumours, genotoxic effects, neurological effects and neurodegenerative diseases, immune system deregulation, allergic and inflammatory responses, breast cancer, miscarriage and some cardiovascular effects." <http://www.ncbi.nlm.nih.gov/pubmed/18242044>

#### **Magnetic-field-induced DNA strand breaks in brain cells of the rat.**

"Acute magnetic field exposure increased apoptosis and necrosis of brain cells in the rat." <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241963/>

#### **Single- and double-strand DNA breaks in rat brain cells after acute exposure to radiofrequency electromagnetic radiation.**

"An increase in both types of DNA strand breaks was observed after exposure to either the pulsed or continuous-wave radiation" <http://www.ncbi.nlm.nih.gov/pubmed/8627134>

**Blood-brain barrier permeability and nerve cell damage in rat brain 14 and 28 days after exposure to microwaves from GSM mobile phones.**

"Albumin extravasation and also its uptake into neurons was seen to be enhanced after 14 d (Kruskal Wallis test:  $p = 0.02$  and  $0.002$ , respectively)... The occurrence of dark neurons in the rat brains... was enhanced later, after 28 d ( $p = 0.02$ ). Furthermore, in the 28-d brain samples, neuronal albumin uptake was significantly correlated to occurrence of damaged neurons (Spearman  $r = 0.41$ ;  $p < 0.01$ )."  
<http://www.ncbi.nlm.nih.gov/pubmed/18821198>

**Nerve cell damage in mammalian brain after exposure to microwaves from GSM mobile phones.**

"We found highly significant ( $p < 0.002$ ) evidence for neuronal damage in the cortex, hippocampus, and basal ganglia in the brains of exposed rats."  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241519/?tool=pubmed>

**Increased blood-brain barrier permeability in mammalian brain 7 days after exposure to the radiation from a GSM-900 mobile phone.**

"The present findings are in agreement with our earlier studies where we have seen increased BBB permeability immediately and 14 days after exposure."  
<http://www.ncbi.nlm.nih.gov/pubmed/19345073>

**Non-thermal DNA breakage by mobile-phone radiation (1800 MHz) in human fibroblasts and in transformed GFSH-R17 rat granulosa cells in vitro Mutation Research/Genetic Toxicology and Environmental Mutagenesis**

Volume 583, Issue 2, 6 June 2005, Pages 178-183

"we conclude that the induced DNA damage cannot be based on thermal effects."  
<http://www.ncbi.nlm.nih.gov/pubmed/15869902>

**Electromagnetic fields stress living cells**

Martin Blank, Reba Goodman,

Department of Physiology, Columbia University, New York, NY, USA

"While low energy EMF interacts with DNA to induce the stress response, increasing EMF energy in the RF range can lead to breaks in DNA strands. It is clear that in order to protect living cells, EMF safety limits must be changed from the current thermal standard, based on energy, to one based on biological responses that occur long before the threshold for thermal changes."  
[http://www.pathophysiologyjournal.com/article/S0928-4680\(09\)00017-0/abstract](http://www.pathophysiologyjournal.com/article/S0928-4680(09)00017-0/abstract)

**Evidence that Electromagnetic Radiation is Genotoxic: The implications for the epidemiology of cancer and cardiac, neurological and reproductive effects.**

Neil Cherry, Environmental Health, Lincoln University, New Zealand

"Many studies, from independent laboratories, have shown that ELF, RF/MW and cell phone radiation, significantly increases chromosome aberrations in exposed cells, including cells taken from human beings who have been exposed to EMR in occupational situations. Even at very low intensity radar exposures that were experienced at the U.S. Embassy in Moscow, significant increases in chromosome damage was measured from human blood samples. This evidence shows conclusively that across the EMR spectrum, EMR is genotoxic. Hence it is carcinogenic and teratogenic."  
<http://www.neilcherry.com/documents.php#rf>  
Excerpts [http://www.vws.org/documents/7Dr.CherryEvidence\\_000.pdf](http://www.vws.org/documents/7Dr.CherryEvidence_000.pdf)

**Public Health Implications of Wireless Technologies**

"Existing safety standards are obsolete because they are based solely on thermal effects from acute exposures. The rapidly expanding development of new wireless technologies and the long latency for the development of such serious diseases as brain cancers means that failure to take immediate action to reduce risks may result in an epidemic of potentially fatal diseases in the future."  
[http://www.pathophysiologyjournal.com/article/S0928-4680\(09\)00017-0/abstract](http://www.pathophysiologyjournal.com/article/S0928-4680(09)00017-0/abstract)

**Genotoxic Effects of Radiofrequency Electromagnetic Fields**

"Taking altogether there is ample evidence that RF-EMF can alter the genetic material of exposed cells in vivo and in vitro and in more than one way." [http://www.pathophysiologyjournal.com/article/S0928-4680\(09\)00016-9/abstract](http://www.pathophysiologyjournal.com/article/S0928-4680(09)00016-9/abstract)

**Cognitive impairment in rats after long-term exposure to GSM-900 mobile phone radiation.**

"Our results suggest significantly reduced memory functions in rats after GSM microwave exposure ( $P = 0.02$ )." <http://www.ncbi.nlm.nih.gov/pubmed/18044737>

**Dr. Sheela V. Basrur, Medical Officer of Health to Toronto Board of Health**

Subject: Health Effects of Wireless Telephone Transmission Towers

"Given the degree of uncertainty as to whether exposure levels below those permitted by Safety Code 6 could result in adverse health effects, Toronto Public Health supports the implementation of a prudent avoidance policy. Such a policy encourages the adoption of individual or societal actions to avoid unnecessary exposures to radio frequencies that entail little or no cost."

[http://www.toronto.ca/health/hphe/pdf/rf\\_boh\\_final.pdf](http://www.toronto.ca/health/hphe/pdf/rf_boh_final.pdf)

**Cellular phone use and risk of benign and malignant tumours.**

American Journal of Epidemiology 167(4), 457-467, 2008.

"Based on the largest number of benign PGT patients reported to date, our results suggest an association between cellular phone use and PGTs (*parotid gland tumors*)." <http://aje.oxfordjournals.org/cgi/content/abstract/167/4/457>

**Mobile phone use and risk of tumors: a meta analysis.**

Journal of Clinical Oncology 27(33), 5565-5572, 2009.

"The current study found that there is possible evidence linking mobile phone use to an increased risk of tumors from a meta-analysis of low-biased case-control studies." <http://jco.ascopubs.org/cgi/mjgca?>

SEARCHID=1&VOLUME=27&FIRSTPAGE=5565&FIRSTINDEX=0&hits=10&RESULTFORMAT=&gca=jco%3B27%2F33%2F5565

**Cardiovascular risk under electromagnetic exposure.**

"The authors concluded that the electromagnetic field exposure of medical staff in physiotherapy could be associated with adverse effects on the cardiovascular system." [http://www.emf-portal.de/viewer.php?](http://www.emf-portal.de/viewer.php?aid=15833&sid=6f336c7ba112baee42d94bd8c34170ac&sform=6&pag_idx=80&l=e)

[aid=15833&sid=6f336c7ba112baee42d94bd8c34170ac&sform=6&pag\\_idx=80&l=e](http://www.emf-portal.de/viewer.php?aid=15833&sid=6f336c7ba112baee42d94bd8c34170ac&sform=6&pag_idx=80&l=e)

**Radiofrequency-induced carcinogenesis: cellular calcium homeostasis changes as a triggering factor.**

"The findings suggest that in exposed animals, carcinogenesis may be induced earlier and with different pathological forms than in control mice." [http://www.emf-portal.de/viewer.php?](http://www.emf-portal.de/viewer.php?aid=12248&sid=f980ebaeb7b9ce8a9a0c808d6d414550&sform=6&pag_idx=30&l=e)

[aid=12248&sid=f980ebaeb7b9ce8a9a0c808d6d414550&sform=6&pag\\_idx=30&l=e](http://www.emf-portal.de/viewer.php?aid=12248&sid=f980ebaeb7b9ce8a9a0c808d6d414550&sform=6&pag_idx=30&l=e)

**Non-thermal activation of the hsp27/p38MAPK stress pathway by mobile phone radiation in human endothelial cells: Molecular mechanism for cancer- and blood-brain barrier-related effects.**

"The authors conclude that low energy microwave irradiation may be harmful as it is sufficient to alter the levels of thyroid hormones as well as the emotional reactivity of rats." [http://www.emf-portal.de/viewer.php?](http://www.emf-portal.de/viewer.php?aid=16182&sid=066e46c73a86b30f2c00fed54467f5f4&sform=6&pag_idx=0&l=e)

[aid=16182&sid=066e46c73a86b30f2c00fed54467f5f4&sform=6&pag\\_idx=0&l=e](http://www.emf-portal.de/viewer.php?aid=16182&sid=066e46c73a86b30f2c00fed54467f5f4&sform=6&pag_idx=0&l=e)

**The Effects of Microwave emitted by Cellular Phones on Ovarian Follicles in Rats.**

"The number of pups per delivery was significantly decreased in the exposure group compared to the control group. The data showed that in the pups of the exposed group, the number of follicles was significantly lower than that in the control group. The decreased number of follicles in pups exposed to mobile phone microwaves suggest that intrauterine exposure has toxic effects on ovaries."

<http://www.scribd.com/doc/33692615/The-Effects-of-MW-Emitted-by-Cell-Phones-on-Murine-Ovarian-Follicles>  
[http://www.emf-portal.de/viewer.php?aid=16824&sid=a3b8ea65f712333b9931cbf59ffe2df&sform=6&pag\\_idx=10&l=e](http://www.emf-portal.de/viewer.php?aid=16824&sid=a3b8ea65f712333b9931cbf59ffe2df&sform=6&pag_idx=10&l=e)

#### **Effects of mobile phone radiation on serum testosterone in Wistar albino rats.**

"The data showed that exposure to mobile phones for 60 minutes/day for the total period of 3 months significantly decreased the serum testosterone level in rats compared to the control group. Testosterone is a primary male gender hormone and any change in the normal levels may be devastating for reproductive and general health." [http://www.emf-portal.de/viewer.php?aid=18557&sid=066e46c73a86b30f2c00fed54467f5f4&sform=6&pag\\_idx=0&l=e](http://www.emf-portal.de/viewer.php?aid=18557&sid=066e46c73a86b30f2c00fed54467f5f4&sform=6&pag_idx=0&l=e)

#### **Increase of brain ammonia after microwave irradiation and its mechanism.**

"The ammonia concentration was found about 5 times higher in animals exposed to 0.4 s than in non or longer exposed animals." [http://www.emf-portal.de/viewer.php?aid=4971&sid=032f7707821b85619c2ea16bf9441d34&sform=6&pag\\_idx=60&l=e](http://www.emf-portal.de/viewer.php?aid=4971&sid=032f7707821b85619c2ea16bf9441d34&sform=6&pag_idx=60&l=e)

#### **RF radiation-induced changes in the prenatal development of mice.**

By: Magras IN, Xenos TD Published in: Bioelectromagnetics 1997; 18 (6): 455 - 461  
 "A progressive decrease in the number of newborns per dam was found, which ended in irreversible infertility."

#### **Melanoma incidence and frequency modulation (FM) broadcasting**

"The authors concluded that melanoma is associated with exposure to FM broadcasting."  
 Hallberg Ö, Johansson O, Arch Environ Health 2002; 57: 32-40 <http://www.ncbi.nlm.nih.gov/pubmed/12071358>

#### **Cancer trends during the 20th century**

"Breast, bladder, prostate, lung, colon and cutaneous melanoma cancers are all associated with each other. Figures 15-17 and ref. 11 relate melanoma to radio-frequency EMF."  
 "...closing down of public radio transmitters seems to have a strong effect in reducing cancer mortality..."  
 Hallberg Ö, Johansson O, J Aust Coll Nutr & Env Med 2002; 21: 3-8  
<http://www.icems.eu/docs/Johansson.pdf>

#### **Malignant melanoma of the skin – not a sunshine story!**

"We conclude that continuous disturbance of cell repair mechanisms by body-resonant electromagnetic fields seems to amplify the carcinogenic effects resulting from cell damage caused e.g. by UV-radiation."  
 Hallberg Ö, Johansson O, Med Sci Monit 2004; 10: CR336-340 <http://www.ncbi.nlm.nih.gov/pubmed/15232509>

#### **Electro hypersensitivity: Observations in the human skin of a physical impairment**

"In summary, it is evident from our preliminary data that various biological alterations are present in the electrohypersensitive persons claiming to suffer from exposure of electromagnetic fields."  
 Johansson O, Symposium on 'Electrical Sensitivity in Human Beings', Royal Society of Medicine, London, U.K., September 11, 2004 (abstr.)  
<http://www.icems.eu/docs/Johansson.pdf>

#### **Does GSM 1800 MHz affect the public health in Sweden?**

"The data shows that the health of the whole Swedish population is threatened."  
 "The responsible authorities must seriously consider possible health implications from the GSM 1800 MHz system"  
 Hallberg Ö, Johansson O, In: Proceedings of the 3rd International Workshop 'Biological Effects of EMFs', Kos, Greece, October 4-8, 2004 Johansson O, 'Electro hypersensitivity: Observations in the human skin of a physical impairment', WHO Workshop on 'Electrical Hypersensitivity', Prague, Czech Republic, October 25-27, 2004 (abstr.) **1997 – A curious year in Sweden**

Hallberg Ö, Johansson O., Eur J Cancer Prev 2004; 13: 535-538

"We note that 1997 was a very curious year in that a large number of health-related measures suddenly started to indicate a fast degradation in the health of the Swedish population. Several health characteristics and diseases seem to correlate with the Swedish introduction of the GSM 1800MHz system both in time and place."

#### **Long-term sickness and mobile phone use**

"...strong similarity between increased mobile phone use and health degradation in Sweden. Other investigations have shown a strong correlation between mobile system transmitter coverage and health including recovery times from accidents and surgery operations. All in all we can only conclude that it is now time to reconsider the benefit of handheld radiating devices, nowadays being marketed also towards innocent children. ... health care expenses likely to be caused by mobile phone and transmitter radiation."

Hallberg Ö, Johansson O, J Aust Coll Nutr & Env Med, 2004; 23: 11-12 <http://www.iddd.de/umtsno/lthhallberg.pdf>

#### **Mobile handset output power and health**

"we show that there is a very strong correlation between health degradation and weak GSM coverage, while there is no such relation noticed for the time period 1981–1991 when no handset power regulation was applied."

Hallberg Ö, Johansson O, Electromag Biol Med 2004; 23: 229-239  
<http://informahealthcare.com/doi/abs/10.1081/JBC-200044239>

#### **FM broadcasting exposure time and malignant melanoma incidence**

"Malignant melanoma is an example of a disease that was very rare before 1955 but has increased dramatically over the past 50 years. This increase may be due to an environmental agent which interferes with cell repair mechanisms normally active during sleep. We have shown that an environmental change of this type might be the exposure of a population to whole-body resonant EMFs via FM broadcasting transmitters. In Sweden FM broadcasting started in 1955 and had increased considerably by 1957."

Hallberg Ö, Johansson O, Electromag Biol Med 2005; 24: 1-8  
[http://www.avaate.org/IMG/pdf/melanoma\\_electromagneticbiologyandmedicine\\_2005.pdf](http://www.avaate.org/IMG/pdf/melanoma_electromagneticbiologyandmedicine_2005.pdf)

#### **Alzheimer mortality – why does it increase so fast in sparsely populated areas?**

"The two factors having the strongest correlation with decreased health quality were the estimated average power output from mobile phones (positive correlation) and the reported coverage from the global system for mobile communication base stations (negative correlation) in each county."

<http://www.scribd.com/doc/24980389/Alzheimer-Mortality-%E2%80%93-Why-Does-It-Increase>

[http://journals.lww.com/eurjancerprev/Abstract/2007/02000/Adverse\\_health\\_indicators\\_correlating\\_with.10.aspx](http://journals.lww.com/eurjancerprev/Abstract/2007/02000/Adverse_health_indicators_correlating_with.10.aspx)

Hallberg Ö, Johansson O, Europ Biol Bioelectromag 2005, in press

#### **Disturbance of the immune system by electromagnetic fields**

##### **- A potentially underlying cause for cellular damage and tissue repair reduction**

**which could lead to disease and impairment** "A number of papers dealing with the effects of modern, man-made electromagnetic fields (EMFs) on the immune system are summarized in the present review. EMFs disturb immune function through stimulation of various allergic and inflammatory responses, as well as effects on tissue repair processes. Such disturbances increase the risks for various diseases, including cancer. These and the EMF effects on other biological processes (e.g. DNA damage, neurological effects, etc.) are now widely reported to occur at exposure levels significantly below most current national and international safety limits. Obviously, biologically based exposure standards are needed to prevent disruption of normal body processes and potential adverse health effects of chronic

exposure." [http://www.emrnetwork.org/pdfs/PATPHY\\_621.pdf](http://www.emrnetwork.org/pdfs/PATPHY_621.pdf)

**Non-thermal effects in the microwave induced unfolding of proteins observed by chaperone binding.**

"We show that microwaves cause a significantly higher degree of unfolding than conventional thermal stress for protein solutions heated to the same maximum temperature."

<http://www.ncbi.nlm.nih.gov/pubmed/18240290>

**Light and electron microscopic study of the thyroid gland in rats exposed to power-frequency electromagnetic fields**

"the results of this study show the stimulative effect of power-frequency EMF on thyroid gland at both the light microscope and the ultrastructural level." <http://jeb.biologists.org/cgi/reprint/209/17/3322.pdf>

**Wireless Devices, Standards, and Microwave Radiation in the Education Environment**

"Until we know beyond the shadow of a doubt that this technology can be safely used by children, we are behaving like irresponsible adults by treating our children as guinea pigs in this uncontrolled experiment."

<http://www.vws.org/documents/14.EMFGaryBrowninEducn.pdf>

**Cell Membrane and Electromagnetic Fields**

"Electromagnetic field can affect the protein distribution pattern and the proliferation rate of different kind of cells. Protein clusterization may induce a changement in cell permeability control. The evidence of Biological effects are so strong that the icnirp guidelines are to be modified to lower epidemiological limits. Public exposure Limit - To avoid the demonstrated health effects the public, exposure limit should be 0.02 mW/cm2." [http://www.salzburg.gv.at/Proceedings\\_%2813%29\\_Marinelli.pdf](http://www.salzburg.gv.at/Proceedings_%2813%29_Marinelli.pdf)

**Rationale for Setting EMF Exposure Standards**

**(Based on large-scale human studies of 1312 workers and 1859 students in China)**

"In summary, the results showed that chronic exposure to EMFs are associated with a variety of non-specific symptoms, including increased frequency of neuroses, liability of vegetation nervous system, and slight changes in peripheral blood, lens, and non-specific immune function... The health hazard develops after overpassing of the adaptation/defense processes of the subjects. However, the existence of health hazardous effects of RF (*radiofrequency*) and MW (*microwave*) could not be denied." [http://www.salzburg.gv.at/Proceedings\\_%2820%29\\_Cheng.pdf](http://www.salzburg.gv.at/Proceedings_%2820%29_Cheng.pdf)

**Comparison of EMF standard and EMF research in China**

CAO Zhaojin - National Institute for Environmental Health and Related Product Safety, China 2006

"Epidemiological studies showed that low intensity RF exposure (lower than EMF standard,  $<10\mu\text{W}/\text{cm}^2$ ) [Note: Current Canadian standard is  $1000\mu\text{W}/\text{cm}^2$ ] might have effects on human neurobehavior, neurasthenia, cataract, and sperm development; low intensity RF might result in abnormal of ECG, EEG, and rCBF, and low intensity RF might increase the rate of mutation and micro nuclei in lymphocytes. Animal studies showed that RF might have effects on animal ability of study, memory and male reproduction; RF might disturb the elimination ability of free radicals and the regulating ability of brain neurotransmitters. In vitro studies found that RF might down regulate the cytochrome oxidase activity of neurons and might damage the retention of brain, it implies that RF might have some relation with Alzheimer's dementia." <http://www.icems.eu/docs/Cao.pdf>

**Electromagnetic Fields produced by Incubators influence Heart Rate Variability in Newborns**

C V Bellieni, M Acampa, M Maffei, S Maffei, S Perrone, I Pinto, N Stacchini, G Buonocore

"EMFs produced by incubators influence newborns' HRV, showing an influence on

their autonomous nervous system... A reduced HRV is a powerful and independent predictor of adverse prognosis in patients with heart disease and in the general population, and the proarrhythmic role exerted by transient or persistent alterations in sympathetic and vagal control mechanisms is well known. Specifically, sympathetic hyperactivity favours the onset of lifethreatening cardiac arrhythmias... newborns should be one case in which a policy of prudent avoidance of an EMF is warranted, perhaps because no study has so far excluded the possibility of negative consequences of their chronic exposition to a high EMF in incubators."

<http://www.avaate.org/IMG/pdf/incuvadorafn132738.pdf>

#### **Effects of Cell Phone Radiofrequency Signal Exposure on Brain Glucose Metabolism**

"In healthy participants and compared with no exposure, 50-minute cell phone exposure was associated with increased brain glucose metabolism in the region closest to the antenna." <http://jama.ama-assn.org/content/305/8/808.short>

#### **Cell Phone Radiofrequency Radiation Exposure and Brain Glucose Metabolism**

"the results point to a conclusion that cell phone use can possibly affect brain function, and specific effects may depend on the regions of the brain affected." <http://citizensforsafetechnology.org/uploads/scribd/JAMA-2011-Lai-828-9.pdf>

#### **Biological Effects of Mobile Phone Electromagnetic Field on Chick Embryo (risk assessment using the mortality rate)**

"Chicken embryos were exposed to EMF from GSM mobile phone during the embryonic development (21 days). As a result the embryo mortality rate in the incubation period increased to 75% (versus 16% in control group)." <http://www.ncbi.nlm.nih.gov/pubmed/14658287>

#### **Tumour risk associated with use of cellular phones or cordless telephones - World Journal of Surgical Oncology 2006**

We found for all studied phone types an increased risk for brain tumours, mainly acoustic neuroma and malignant brain tumours. OR increased with latency period, especially for astrocytoma grade III-IV. <http://www.wjso.com/content/4/1/74>

#### **Lethal And Teratogenic Effects Of Long-Term Low-Intensity Radio Frequency Radiation At 428 Mhz On Developing Chick Embryo**

"...for more than 20 days resulted in embryo lethal and/or teratogenic effects and delayed hatching. These adverse biological effects were not due to any thermal effect of the RF radiation. We have demonstrated teratogenicity in the chick embryo as a result of protracted low-dose RF irradiation."

<http://onlinelibrary.wiley.com/doi/10.1002/tera.1420430616/abstract> "Almost one fourth of dead embryos in the radio frequency group occurred within 10 days after incubation and the rest was due to death within the eggshell following inability to hatch... A functional abnormality consisting of creeping movement and inability to stand was found in 89% of exposed embryos, but not in the control group." [http://www.emf-portal.de/viewer.php?aid=2803&sid=aa7d205836c733391828675f0d64d4ae&sform=6&pag\\_idx=130&l=e](http://www.emf-portal.de/viewer.php?aid=2803&sid=aa7d205836c733391828675f0d64d4ae&sform=6&pag_idx=130&l=e)

#### **Public health impact of electromagnetic radiation**

##### **Journal of the Royal Institute of Public Health, Public Health (2008)**

"Considering the potential long-term danger, physicians and public health officials should alert individual patients and the public to this issue and provide ongoing information on precautions to diminish potential risk associated with EMF exposure." [http://www.avaate.org/IMG/pdf/Public\\_Health\\_-\\_EMF.pdf](http://www.avaate.org/IMG/pdf/Public_Health_-_EMF.pdf)

##### **Setting Prudent Public Health Policy for Electromagnetic Field Exposures**

[http://www.bcuc.com/Documents/Proceedings/2010/DOC\\_24467\\_C3-14\\_McMurtry\\_Evidence\\_Prudent-Health-EMF.pdf](http://www.bcuc.com/Documents/Proceedings/2010/DOC_24467_C3-14_McMurtry_Evidence_Prudent-Health-EMF.pdf)

##### **Electromagnetic fields and DNA damage- Pathophysiology 2009**

[http://www.mreengenharia.com.br/pathfisiology/Pathophysiology\\_2009\\_H\\_Lai.pdf](http://www.mreengenharia.com.br/pathfisiology/Pathophysiology_2009_H_Lai.pdf)

##### **Wireless Radiation in the Etiology and Treatment of Autism: Clinical Observations and Mechanisms - J. Aust. Coll. Nutr. & Env. Med. 2007**

[http://www.buergerwelle.de/pdf/emr\\_autism\\_acnem\\_final\\_1.pdf](http://www.buergerwelle.de/pdf/emr_autism_acnem_final_1.pdf)

Read more:

<http://www.vancouversun.com/health/Parents+call+halt+installations+schools+citing+health+concerns/4679368/story.html#comments#ixzz1KqolQrpw>

#### **Cell Phone Radiation on Human Sperm**

**University of California, Berkeley 2011**

"Eight of the nine original studies reported adverse effects..."

<http://tinyurl.com/6fgtb4d>

#### **Environmental Medicine- Electromagnetic Fields- Austrian Medical Association 2007**

"Children and adolescents should use cordless and mobile phones, if at all, in emergencies

only. "http://www.weepinitiative.org/LINKEDDOCS/scientific/elektrosmog-environmental-medicine-evaluation-2007.pdf

#### **Electromagnetic fields on cells- Department - Biochemical and Biophysical Research**

"We have shown that this coherent vibration of electric charge is able to irregularly gate electrosensitive channels on the plasma membrane and thus cause disruption of the cell's electrochemical balance and function."

[http://kyttariki.biol.uoa.gr/mobile\\_phones/article-2002.pdf](http://kyttariki.biol.uoa.gr/mobile_phones/article-2002.pdf)

#### **Brain-tumour risk in mobile-phone**

**Occupational and Environmental Medicine 2011**

[http://www.avaate.org/IMG/pdf/CardisOccup\\_Environ\\_Med-2011-Cardis-oem.2010.061358\\_2\\_.pdf](http://www.avaate.org/IMG/pdf/CardisOccup_Environ_Med-2011-Cardis-oem.2010.061358_2_.pdf)

#### **American Academy of Pediatrics, 2005**

Concerns about the potential vulnerability of children to radio frequency (RF) fields have been raised because of the potentially greater susceptibility of their developing nervous systems;

in addition, their brain tissue is more conductive, RF penetration is greater relative to head size, and they will have a longer lifetime of exposure than adults.

<http://www.rebprotocol.net/November2007/The%20sensitivity%20of%20children%20to%20electromagnetic%20fields%20Kheifets%20etal%202006%2013pp.pdf>

#### **Pathophysiology of cell phone radiation- Reproductive Biology and Endocrinology 2009**

<http://www.springerlink.com/content/235547qg0vww237n/fulltext.pdf>

#### **Mutagenic response of 2.45 GHz radiation- International Journal Radiation Biology**

<http://www.kawarthasafetechnology.org/wp-content/uploads/2011/03/RatBrainEMFExposureStudyApr2010.pdf>

<http://www.kawarthasafetechnology.org/wp-content/uploads/2011/03/RatBrainEMFExposureStudyApr2010.pdf>

#### **Pulsed 2.4 GHz Radiation - Biological Effects 2002**

[http://www.magdahavas.com/wordpress/wp-content/uploads/2010/10/dect\\_study.pdf](http://www.magdahavas.com/wordpress/wp-content/uploads/2010/10/dect_study.pdf)

#### **Effects of Cell Phone - Brain Glucose Metabolism-American Medical Association, 2011**

<http://jama.ama-assn.org/content/305/8/808.short>

#### **Effects from cellular phones on human ejaculated semen- Reproductive Medicine, 2009**

[http://www.fertstert.org/article/S0015-0282\(08\)03356-6/abstract](http://www.fertstert.org/article/S0015-0282(08)03356-6/abstract)

Read more:

<http://www.vancouversun.com/health/Parents+call+halt+installations+schools+citing+health+concerns/4679368/story.html#comments#ixzz1KqoUnXih>

#### **Tumour risk associated with use of cellular phones or cordless telephones -**

**World Journal of Surgical Oncology 2006, <http://www.wjso.com/content/4/1/74>**

**Public health impact of electromagnetic radiation** Journal of the Royal Institute of

Public Health, Public Health 2008, [http://www.avaate.org/IMG/pdf/Public\\_Health\\_-\\_EMF.pdf](http://www.avaate.org/IMG/pdf/Public_Health_-_EMF.pdf)

#### Setting Prudent Public Health Policy for Electromagnetic Field Exposures

[http://www.bcuc.com/Documents/Proceedings/2010/DOC\\_24467\\_C3-14\\_McMurtry\\_Evidence\\_Prudent-Health-EMF.pdf](http://www.bcuc.com/Documents/Proceedings/2010/DOC_24467_C3-14_McMurtry_Evidence_Prudent-Health-EMF.pdf)

#### Electromagnetic fields and DNA damage- Pathophysiology 2009

[http://www.mreengenharia.com.br/pathfisiology/Pathophysiology\\_2009\\_H\\_Lai.pdf](http://www.mreengenharia.com.br/pathfisiology/Pathophysiology_2009_H_Lai.pdf)

#### The Effects of Microwave emitted by Cellular Phones on Ovarian Follicles in Rats

"...the number of follicles was lower than that in the control group. The decreased number of follicles in pups exposed to mobile phone microwaves suggest that intrauterine exposure has toxic effects on ovaries. Conclusion: We suggest that the microwaves of mobile phones might decrease the number of follicles in rats by several known and, no doubt, countless unknown mechanisms."

<http://www.scribd.com/doc/33692615/The-Effects-of-MW-Emitted-by-Cell-Phones-on-Murine-Ovarian-Follicles>

#### Report on Cell Tower Radiation

Department of Telecommunication, Delhi, India

Prepared by Prof. Girish Kumar [gkumar@ee.iltb.ac](mailto:gkumar@ee.iltb.ac)

Electrical Engineering Department IIT Bombay, Powai, Mumbai – 400 076 - December 2010

"Let's do some simple calculation of how much microwave power will be absorbed by human body if exposed to the so called safe radiation level adopted in India of power density = 4.7W/m<sup>2</sup> for GSM900 band. If we model human body as a cylinder, then its area will be 1.436square meter (average height 5'6" = 1.67 m and waist 34" = 86 cm). So, power recd. by human body will be power density x area = 6.75 Watts. In one hour, microwave energy absorbed will be 6.75 x 3600 = 24.3 KW-sec. In one day, microwave energy absorbed will be 24.3 x 24 = 583.2KW-sec. A typical microwave oven has a rating of 700 to 1000 W, and with say 60% efficiency, microwave power output is approximately 500 W. This implies that human body can be safely kept in a microwave oven for 583.2 KW-sec / 500 W = 1166 seconds = 19 minutes per day. How many people in the world are willing to put themselves, their family members, and their unborn children in an open microwave oven for 19 minutes/day? Telecom providers or policy maker can argue about body being adaptable to external threats and the radiation is spread over whole day. However, question remains, would we like to put our citizens in an open microwave oven for 19 minutes/day over the years. Also, this is only for a single source. For multiple sources, it will increase correspondingly. Thus, the safe limit adopted by India is extremely high and millions of people are suffering because of this."

(Note: Canadian standard is 10W/m<sup>2</sup> which is more than twice the exposure limit of India.)

Conclusion: "The seriousness of the health hazards due to radiation from the cell phones and cell towers has not been realized among the common man. Cell operators continue to claim that there are no health issues. Even organizations like WHO, ICNIRP, FCC, etc. have not recommended stricter safe radiation guidelines, whereas several countries have adopted radiation norms, which are 1/100th to 1/1000th of these values based on their studies. Cell phone industry is becoming another cigarette industry, which kept claiming that smoking is not harmful and now there are millions of people around the world who have suffered from smoking. In fact, cell phone/tower radiation is worse than smoking; as one cannot see it or smell it, and its effect on health is noted after a long period of exposure.... Unfortunately, ignorance and non-awareness adds to this misery and all of us are absorbing this slow poison unknowingly. Even if people are aware of the radiation hazard, they may not have the choice to move away from it if the tower is installed near their office or residential building. In addition to the continuous radiation from cell towers, there is radiation from cell phones, wireless phones, computers, laptops, TV towers, FM

towers, AM towers, microwave ovens, etc. We are exposed to all these radiations which are additive in nature. Hence, it is imperative that stricter radiation norms must be enforced by the policy makers... If people in the mobile companies think there is no health hazard, then let them stand in front of their own transmitting tower at 1m distance in the main beam for 6 hours – are they willing to take the risk? Similar effect will be there at 10m distance in about 600 hours (25 days). If mobile companies accept that radiation causes serious health problems... then researchers/technocrats/entrepreneurs will come out with possible solutions, which may be expensive but that cannot be greater than the health risk faced by humans, birds, animals and environment."

<http://tinyurl.com/3tc8nf6>

#### **Cell phone use and behavioural problems in young children.**

"The results showed positive associations between cell phone use and behavioural problems in young children. The highest odds ratios for behavioural problems were for children who had both prenatal and postnatal exposure to cell phones compared with children not exposed during either time period (OR 1.5, CI 1.4-1.7). The findings of the previous study by Divan et al (2008) were replicated in a separate group of participants demonstrating that cell phone use was associated with behavioural problems at the age of 7 years in children."

<http://www.emf-portal.de/viewer.php?aid=18825&l=e>  
<http://www.independent.co.uk/life-style/health-and-families/health-news/warning-using-a-mobile-phone-while-pregnant-can-seriously-damage-your-baby-830352.html>

#### **Exposure to radio-frequency electromagnetic fields and behavioural problems in Bavarian children and adolescents.**

An analysis of the behaviour subgroups showed an association between the highest exposure group and conduct problems for adolescents and for children.

<http://www.emf-portal.de/viewer.php?aid=17774&l=e>

#### **Analyzing the Health Impacts of Modern Telecommunications Microwaves.**

"In the present study we showed that microwave radiations used in modern mobile telecommunications can damage DNA and induce cell death or heritable mutations which may in turn result in reproduction decreases, degenerative diseases, or cancer."

<http://www.citizensforsafetechnology.org/Analysing-the-Health-Impacts-of-modern-telecommunications-microwaves,2,376>

#### **Non-Thermal Effects And Mechanisms Of Interaction Between Electromagnetic Fields And Living Matter**

National Institute for the Study and Control of Cancer and Environmental Diseases "Bernardino Ramazzini" Bologna, Italy 2010

[http://www.icems.eu/papers/ramazzini\\_library5\\_part1.pdf](http://www.icems.eu/papers/ramazzini_library5_part1.pdf)

#### **2011 International Association of Fire Fighters' Position on the Health Effects from Radio Frequency/Microwave (RF/MW) Radiation in Fire Department Facilities**

"There are established biological effects from exposure to low-level RF/MW radiation. Such biological effects are recognized as markers of adverse health effects when they arise from exposure to toxic chemicals..."

<http://www.iaff.org/hs/Facts/CellTowerFinal.asp#ref23>

#### **The Bioinitiative Report**

Review of over 2,000 scientific studies on electromagnetic fields, by independent (non-industry-funded) scientists.

<http://www.bioinitiative.org/freeaccess/report/index.htm>

#### **Cell phones and brain tumors: a review including the long-term epidemiologic data**

"The results indicate that using a cell phone for ≥10 years approximately doubles the risk of being diagnosed with a brain tumor on the same ("ipsilateral") side of the head as